

level where they are generated. The roles and responsibilities of the various levels of the government should be decided. As much participation as possible of the population should be encouraged, with the government establishing the regulatory frameworks but delegating responsibilities to the different regional and local levels.

A country with a hundred million users of water should have effective management practices for this resource, which should be based on proper administration, reassignment of the roles for the different levels of government, promotion of informed social participation in sectoral decisions and understanding of the fact that the challenge implies a joint programme of work between government and the rest of civil society. Much work remains to be done before this can be achieved. However, in the long run, continuation of the present business-as-usual approach is not an option. Management and administrative practices must change. At the dawn of the 21st century, Mexico simply has no other option.

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Workshop on Water Conservation, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia, 3–5 April 2000

The Water Section of the Centre for Environment and Water of the Research Institute, King Fahd University of Petroleum and Minerals (KFUPM), organized a Workshop on Water Conservation in Dhahran, Saudi Arabia, 3–5 April 2000. The primary objective of the workshop was to provide a forum for exchange of knowledge and experiences on recent advances on water conservation for domestic, industrial and agricultural uses. Some 800 participants from different disciplines attended the Workshop. The presentations included experiences from Bahrain, Brazil, Finland, Kuwait, Sweden, Saudi Arabia, the UK, and the USA. All technical papers by local experts covered a broad spectrum of water-conservation issues from various disciplinary orientations.

The issues discussed included water management and conservation for industrial purposes; treatment and reuse of industrial wastewater; protection and conservation of groundwater for industrial purposes; and impacts of industrial wastewater on the environment. National, regional and global perspectives on industrial water conservation were analysed, and very good presentations on technical, economic, environmental and policy-related issues gave the participants opportunities for in-depth discussions.

Water resources management has become an important issue for the world, and Saudi Arabia is not an exception. The country is located in an arid region, and has less than 150 mm of average annual rainfall, high evaporation, limited surface and groundwater, as well as high living standards and population growth. According to the World Development Report 1999–2000 of the World Bank, the population of Saudi Arabia increased from 9.4 million in 1980 to 20.7 million in 1998, and is expected to double by 2025. The challenges imposed by the climate, geography, and steady increases in population and economic activities have resulted in an accelerating pressure on the government to provide

water and wastewater management facilities for the municipal, agricultural and industrial users of the country. According to Dr Walid Abderrahman, desalination of seawater and brackish water and the limited groundwater available are the main sources of water in the Kingdom. Thus far, 57 desalination plants have been constructed along the Red Sea and the Arabian Gulf coasts. Desalinated water currently covers approximately half of the national demand, the rest being pumped from deep and shallow aquifers.

In terms of agriculture, the cultivated areas of Saudi Arabia have increased from 0.4 million ha in 1971 to 1.62 million ha in 1992. In 1993, in order to reduce the total amount of water used for irrigation, policies for wheat production were changed, and subsidies were reduced by 25%. This resulted in the reduction of area for wheat cultivation (325 000 ha between 1992 and 1994), and thus the water pumped for this purpose from non-renewable aquifers has declined from 28 576 MCM, to 15 376 MCM during this period.

Economic development in the Kingdom has resulted in increased industrial activities in the areas of petrochemicals, cement and mining. Even though the industrial sector currently represents the smallest percentage of the total water users, their demand is already significant and increasing. This water demand is covered at present mainly from desalination plants and non-renewable aquifers.

Key-note lectures were given during this multidisciplinary workshop by IWRA President Benedito Braga and Past President Asit K. Biswas. In major plenary lectures, Prof. Takashi Asano (USA) reviewed the current status of global wastewater reuse, Dr Ulf Ehlin (Sweden) outlined the approaches taken to improve the water quality of the Baltic Sea, Prof. Lloyd (UK) analysed the groundwater situation in several arid countries, and Dr Muhammed Al-Rashed (Kuwait) discussed the present status of industrial water conservation practices in Kuwait.

The Dhahran water meeting at KFUPM has now become an annual event (this was the third workshop). Even within this relatively short period, it has already become the premier annual water event of the Middle East, for which its main organizer, Dr Walid Abderrahman, is to be congratulated. The main focus of discussion for the next workshop, scheduled for April 2001, will be on desalination.

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